



The IJPB and its organization

The Jean-Pierre Bourgin Institute, headed by David Bouchez, is comprised of four laboratories:

- Cell Biology Laboratory (LBC, director Herman Höfte)
- Genetics & Plant Breeding Station (SGAP, director Philippe Guerche)
- Plant Nitrogen Nutrition Unit (NAP, director Françoise Vedele)
- Seed Biology Laboratory (LBS, director Annie Marion-Poll)

The unification of these four laboratories favours inter-disciplinary and scientific communication, and optimizes research by pooling skills, ideas and infrastructures. The research potential brought together in the IJPB facilitates collaborations at the regional, national and European levels and improves the visibility of plant biology by encouraging scientific education and dialogue with the public. The IJPB is a member of PLANTnet PARIS, a federation including most of the plant research laboratories in "Île-de-France". This grouping by INRA forms the thematic pole "Science and Plant Production" in the PRES UniverSud Paris.

A large part of the financial support for the IJPB comes from the "Agence National de la Recherche", "Région Île-de-France" and "Conseil Général des Yvelines".

IJPB personnel

4 laboratories, 25 research groups,
 330 people, comprised of 230
 permanent staff (INRA, CNRS, CIRAD,
 AgroParisTech, UPMC, UVSQ)
 100 researchers & engineers,
 100 post-docs, PhD students
 and others students

An institute for training

The IJPB is committed to higher education training with universities and top-ranked engineering schools, particularly at the master and doctoral levels. For many years, the IJPB has participated in the Marie-Curie European training program for students (FP5 and FP6).



Institute Jean-Pierre Bourgin

INRA's Plant biology pole in the Ile-de-France

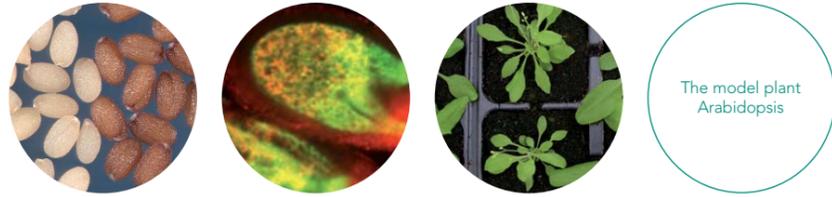


Institut Jean-Pierre Bourgin
 Station de Génétique
 et Amélioration des Plantes
 INRA Centre de Versailles-Grignon
 78026 Versailles Cedex France
 Contact: ijpb@versailles.inra.fr
<http://www-ijpb.versailles.inra.fr>



graphic design www.nicolashubert-graphiste.com





The Jean-Pierre Bourgin Institute (INRA, Versailles) advancing research on genomics and integrative plant biology

Historical origins of the Institute

Throughout its history the laboratories hosted at the Versailles Research Centre have made pioneering contributions to diverse plant biology research topics. The team of Georges Morel, for example, contributed several important discoveries to plant cell biology (meristem culture) and pathology (*Agrobacterium*). Jean-Pierre Bourgin, whose research on plant haploidization had had worldwide impact, subsequently headed the cell biology laboratory for eighteen years. During this time he actively promoted the development of innovative research in plant molecular genetics.

Research themes

IJPB groups' investigate a range of essential plant mechanisms associated with plant production and sustainable agriculture. In particular research is focused on genome evolution and function and responses to environmental stresses, as well as more fundamental plant functions at both the cellular and whole plant level (development, physiology and metabolism), with particular emphasis on the model plant *Arabidopsis thaliana*. Research is also being undertaken using new model species, such as the moss *Physcomitrella patens* for studies into land plant evolution and the grass *Brachypodium distachyon* as a model for feedstocks dedicated to bio-energy and "green chemistry".

Three major research areas

Plant genome structure and evolution: understanding the organization and evolutionary flow of plant genomes, the mechanisms controlling gene expression (epigenetic, chromatin dynamics...), the interactions between the nuclear and organelle genomes (Arabidopsis, oilseed rape, radish).

Developmental plant biology: studying cytoskeleton and cell wall synthesis and organization (cellulose, pectins and lignin), vascular tissue differentiation (phloem), plant architecture (pea, moss), morphogenesis (meristem function, role of phytohormones), reproduction (meiosis, recombination, gametogenesis), leaf and root growth and seed metabolism and germination.

Plant responses to environmental constraints: analyzing the mechanisms for nitrogen use efficiency and assimilation (to obtain new maize and wheat genotypes and reduce nitrogen fertilization), seed quality (major resource for food and industrial products), plant adaptive strategies and genetic and epigenetic factors affecting their variability (cold or drought tolerance).



Diverse and complementary approaches

In an integrative approach to biological phenomena, our studies employ the latest life science tools: functional genomics, quantitative genetics, exploitation of natural variation, biochemistry (proteins, sugars and lipids), analytical chemistry, physiology, cytology (dynamic imaging in living cells). We are also developing novel plant biotechnology tools (new *in vitro* culture methods) and genetic transformation protocols for recalcitrant species (cotton and grasses).

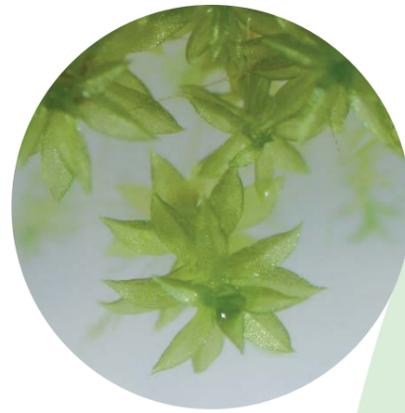
Biological and Experimental Resources

Several *Arabidopsis thaliana* collections have been established by IJPB laboratories and are available to the scientific community. Notably a collection of 60,000 mutant lines was generated using a random insertional mutagenesis technique developed in our laboratories. More recently, a collection of several hundred genotypes from different worldwide origins has been established, in addition to the generation of a collection of several thousand recombinant inbred lines. The IJPB is an approved Biological Resource Centre for the *Arabidopsis thaliana* species.

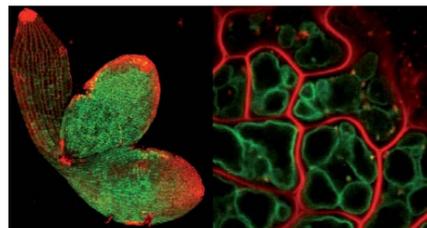
The investment of the IJPB in high throughput approaches. Outstanding experimental facilities dedicated to plant culture are available. With a total area of 5000 m² these comprise glasshouses (4500 m²) and controlled environment rooms (500 m²) for phenotyping or containment culture (GMP manipulation and phytopathogenic micro-organisms).

Three joint technical facilities complete these resources:

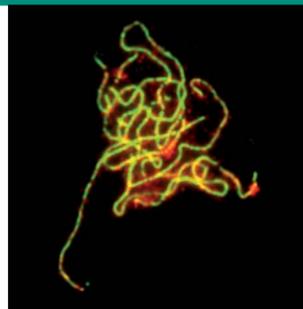
- the Communal Cell imaging Laboratory (LCC) is dedicated to cell imaging, classical and confocal microscopy, immunolocalisation, *in situ* hybridization and image analyses.
- the Communal Biochemistry Laboratory (LCB) studies protein biochemistry and their interactions.
- the Communal Plant Chemistry Laboratory (LCV) is devoted to chemistry, mass spectrometry and infra-red microscopy aspects (plant metabolism, chemical imaging...).



Nitrate-specific transporter expression in seed (green) ▽



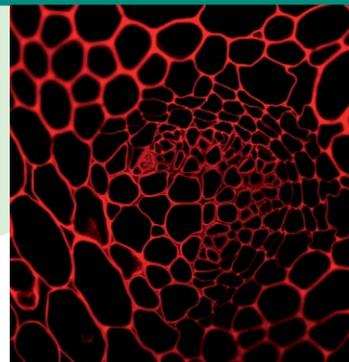
Chromosome visualization during meiotic division in an Arabidopsis cell, which will generate pollen grains ▽



Δ The moss *Physcomitrella patens* ▽ Nitrogen deficiency and growth reduction in Arabidopsis



Section of an Arabidopsis stem, phloem pole and the sieve elements which transport sap ▽



Arabidopsis development regulated by microRNAs ▽ ▽



◀ *Brachypodium distachyon* Activity of a lipid biosynthesis gene promoter during Arabidopsis embryo development ▽

